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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/823,731	04/14/2004	Hong-Lin Chen		4780

7590 07/27/2006

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EXAMINER

SINGH, PREM C

ART UNIT PAPER NUMBER

1764

DATE MAILED: 07/27/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/823,731

Applicant(s)

CHEN, HONG-LIN

Examiner

Prem C. Singh

Art Unit

1764

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 April 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☒ Claim(s) 1 and 6 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 14 April 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Specification

The disclosure is objected to because of the following informalities:

It is not clear from the specifications how does "dissolving of heavy oils in alkanes" differ from "blending of heavy oil with alkanes". It is not clear what the term "reforming" means in the claimed invention. It is not clear whether the alkanes used for blending are also polyaromatic alkanes (C9~C20).

Appropriate correction is required.

Drawings

The subject matter of this application admits of illustration by a drawing to facilitate understanding of the invention. Applicant is required to furnish a drawing under 37 CFR 1.81(c). No new matter may be introduced in the required drawing. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d).

Applicant is given a TWO MONTH time period to submit a drawing in compliance with 37 CFR 1.81. Extensions of time may be obtained under the provisions of 37 CFR

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1.136(a). Failure to timely submit a drawing will result in **ABANDONMENT** of the application.

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the steps of reforming and blending must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

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Figure 1 does not show the input stream to the Constant Pressure Distillation Unit. An arrow is required to show the flow from Catalytic (wrongly shown as Catalyst) Cracking Unit to the gasoline Sweetening Unit. The feed to the Alkylation Unit is coming from MTBE unit. The Specifications should provide brief discussion about the drawing.

The claimed invention is about Liquid Fuel Reforming and Blending Method. The drawing shows a flow chart of an oil refinery for production and blending of gasoline.

Claim Objections

Claims 1 and 6 are objected to because of the following informalities:

Claims 1 and 6 use the term "reforming". Reforming is specifically used in the refinery operations as a step to chemically change or "reform" the molecules by thermal and/or catalytic means using a hydrocarbon feedstock and converting it to "reformed" products under certain operating conditions (temperature, pressure, and residence time). The use of term "reforming" in claim 1 is not clear.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

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Claims 1 and 6 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 1 and 6 use the term "polyaromatic alkanes (C9~C20) ". It is not clear how a polyaromatic alkane (having minimum of 2 rings) can have C9.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chen (WO 01/92441 A1) in view of Mason et al (US Patent 3,352,776).

Claims 1 and 6.

Chen discloses, "The present inventor examined these two aforementioned points and thoroughly researched dissolving heavy oil in an appropriate amount of raw pentane." (Page 5, last paragraph). "Another purpose of the present invention is through various formulations, said liquid fuel can be applied to high-, medium-, and low-speed diesel engines to replace diesel fuel and utilize waste to conserve resources." (Page 6, paragraph 3). The proportion range of the two components of the said liquid fuel provided by the present invention is as follows: Raw pentane-90 to 10%; Heavy oil-10 to 90%." (Page 6, last paragraph). "Raw pentane can also be partially or entirely replaced by a low cost, low octane number, and high volatility alkane such as n-hexane, n-heptane, n-octane, and n-nonane." (Page 7, paragraph 2)

Chen does not specifically mention about polyaromatic alkanes.

Chen does not specifically mention flash point of the blended fuel.

Mason discloses, " Preferred materials suitable for use in accordance with this invention include, but are not limited to, the following: naphthalene, alkyl substituted naphthalenes such as methyl-naphthalene, anthracenes, phenanthrenes, alpha-methyl-naphthyl amine. Mixtures of any two or more of the above solvents can be employed." (Column 5, lines 5-21).

Since both Chen and Mason inventions are trying to use heavy oil by dissolving in solvents, it would have been obvious to one skilled in the art at the time the invention was made to combine Chen and Mason inventions and use polyaromatic alkanes to reform and blend heavy oil to provide more useful fuel oil.

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It would also have been obvious to determine the flash point of the resultant blend of heavy oil and the solvent for its combustion characterization and use as a diesel fuel.

Claims 2 and 7.

Chen discloses for oil hydraulic injection burner raw pentane = 50% and heavy oil = 50% (Page 7, paragraph 1).

Claims 3 and 8.

Chen does not specifically mention about the flash point of the blended fuel.

Since Chen is using the blend as a diesel fuel, it would have been obvious to one skilled in the art at the time the invention was made to modify Chen invention and specify flash point of the blended fuel for its characterization to be used as a diesel fuel.

Claims 4 and 9.

Chen discloses, "Grades B and C are even higher at 480°C." (Page 4, last paragraph). Although Chen does not specifically mention about waste engine oil, waste grease, edible oils, vegetable oils, and boiler fuel, it is known to those skilled in the art that these oils belong to the Grade B and C oils.

Claims 5 and 10.

Chen does not disclose the source of heavy oil.

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Mason discloses that the feedstock "Can be atmospheric residua and vacuum residua, asphaltenes, aromatic tars, aromatic abstracts, cycle stocks, pitches; and like 1000°F+ hydrocarbon materials." (Column 3, lines 2-13).

Mason discloses in Example 1 (Column 7, lines 3-75) treatment of a feed of West Texas vacuum residuum and methyl naphthalene as component A and methyl naphthalene as component B. Mason conducts further steps of thermal treatment and flashing the volatiles and thus producing light and heavy fuels. Mason obtains 65-430°F naphtha, 430-485°F portion containing primarily methyl naphthalene solvent, and a 485-1000°F fuel oil portion. (Column 7, lines 50-55). It is to be noted that Mason uses extra steps of separating the heavy oil/solvent blend.

It would have been obvious to one skilled in the art at the time the invention was made to combine Chen and Mason inventions and use the feed stocks disclosed in Mason invention, reform and blend with the solvent and terminate the process. This would avoid the expensive and time-consuming post-treating steps and use the blended fuel as such without any further separation/treatment.

Although Mason does not disclose the flash point, IBP, and boiling range, and specific gravity of the heavy oil/solvent blend, it would have been obvious to one skilled in the art at the time the invention was made to modify Mason invention and specify the thermo-physical characterization of the fuel blend to make it suitable for use as a diesel fuel.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Strenkert et al, US Patent 3,436,263.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Prem C. Singh whose telephone number is 571-272-6381. The examiner can normally be reached on MF 6:30 AM-3:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola can be reached on 571-272-1444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

A handwritten signature in black ink, consisting of a stylized, cursive name that appears to be "Zam" or similar, followed by a horizontal line underneath.